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I. An Account of the Repetition of an Experiment touching Motion given Bodies included in a Glass, by the Approach of a Finger near its outside : With other Experiments on the Effluvia of Glass. By Mr. Fr. Hauksbee, F. R. S.

THIS Experiment having been but imperfectly made before, I thought a Repetition of such a surprising *Phenomenon* would not be unacceptable to the Society, seeing, not only the *Apparatus* was better adapted, but the Appearance was much more conspicuous. For it was observable, that after the Motion and Attrition had been continu'd about 2 or 3 Minutes, and then ceasing, the Threads within seem'd to hang in a careless Confusion, and were not Instantaneously erected, but in about 3 or 4 Seconds of Time they were so, every way towards the Circumference of the Glass; and seemingly with so much Stoutness, that a Motion of the Glass alone would give them no great Disorder : but that which was the most surprising, was to see a Motion given them by the Approach of ones Hand, Finger, or any other Body, at more than 3 Inches distance from its outward surface, notwithstanding the Threads within touch'd not the inward one. And it was farther observable, that after every Repetition of the Motion of the Wheel, and the new Attrition of the Glass, that the distance, at which the Threads might be mov'd, seem'd to be Increas'd. And I have since found that the Threads could have a notable Motion given them, by blowing towards the Glass with one's Mouth at 3 or 4 Foot distance; by which means
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the Air was put in Motion, and consequently the *Effluvia* of Glafs were fo too. And at another time, when I have fuddenly clapt my fpread Hands on the Upper and Lower Parts of the Globe, there has been fuch a Violent Agitation of the Threads within, as was very fuprizing, and continu'd fo for fome time. But how to Account for fuch Uncommon *Phænomena* feems very difficult. Yet give me leave to make fome Observations on former Experiments of the like kind, which with Remarks on fome others lately made, may in fome meafure folve that difficulty. The Experiment where the directed Threads on the outside of the Glafs would fly the Approach of any thing held near them, feems to me, that the Parts of the *Effluvia* are fuff, and continu'd, that when any part of them are pulht, all that are in the fame Line fuffer the fame Diforder. So even in this Experiment (I have juft now been relating) allowing a *Continuum* of Parts, (as I fee no reafon to the contrary) the *Effluvia* within, and thofe without, are all of a Piece, (for they are both begot by the fame Attrition) that when the *Effluvia* are pulht, or disturb'd without, the *Effluvia* within, in the fame direction are fo too, and confequently the Threads which are upheld and directed by 'em. The *Effluvia* which are provok'd from the Glafs, feem to be, and are nothing elfe but part of the fame Body exerted from it by rubbing; therefore (I think) can be no Impediment to the Motion of its own *Effluvia*, for otherwife I do not fee how the *Effluvia* within, can be produc'd by an Attrition without. And for a farther Confirmation that the *Effluvia* of Glafs act not but in a *Continuum* of their Parts, take the following Experiments.

E X P E R I M E N T I

I took a piece of Leaf Brass, and laid it between two pieces of Wood about an Inch in thickness, and the same distance asunder. Then I apply'd a well rubb'd Tube to attract the Brass, even so near as the Wood would suffer, but gave it no manner of Motion; but so soon as the Wood was remov'd, and the *Continuum* of its Sphere restor'd, the Brass was driven to it very vigorously, without any fresh Attrition; which I think most plainly proves, that the Action of the *Effluvia*, or at least in a great measure, is lost, if the Parts of it are discontinu'd by any thing Interposing, or Interrupting its Spherical Figure. Nay, I have try'd, by holding the Tube so, that its Sphere might meet with no Interruption by the Wood in its Circle round the *Axis* of the Glass, yet this would exhibit nothing neither; by which I find, that if the Parts of the *Effluvia* are in a manner interrupted, their Action is lost, or at least mightily impair'd.

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Again, after the Tube had been fresh rubb'd, and the Leaf-Brass scatter'd on the Table as usual, if a piece of Paper was held to touch the upper part of the Tube, it would not attract at all, altho' approach'd very near; but so soon as the Paper was remov'd, it recover'd its Sphere of Activity, which was very sensible, by giving a brisk motion to those Bodies, which just before were Quiescent. And it may be remembred, that it is mention'd in the Experiment for producing Light by the *Effluvia* of the outward Glass falling on the inward exhausted Glass in Motion, that after the Motions were ceas'd, it was but approaching one's Hand near the Surface of the outward Glass, to produce a Light in the inward one: Whence, by these Experiments 'tis plain, the *Effluvia* within were pusht more vigorously on the inward Glass, by the approach of the Hand without, otherwise no Light would have ensu'd. And farther to prove the stiffness of the Body of the *Effluvia*, 'tis observable, that when a piece of Leaf-Brass is hunted about a Room, that the Brass swims or floats on the Surface of the *Effluvia*; and as that is more or less exerted, so the Brass keeps its distance from it, nor will by any means be suffer'd to sink within it's Sphere, unless it meets with a Body in its way, and then it is attracted and return'd again several times with great swiftness.

E X P E R I M E N T I I I.

Having try'd the Effect of the discontinuing or interrupting of the *Effluvia* of the Affricated Tube on its outward Surface, I was willing to try what would ensue, by filling its Cavity with a Body, which I did, by plugging up one end of it with a Cork, then pouring in at the other dry Writing Sand till it was near full : After that, the Attrition was diligently made, and when held towards the pieces of Brass as usual, no motion was given, till it arriv'd within an Inch or thereabouts of them. And thus on several Tryals it answer'd much alike. And if at the same time the Sand be shot suddenly out, the Tube will attract the same Bodies at double or treble the foremention'd distance, without any fresh Attrition ; which plainly shews, that altho' the Tube will attract when approach'd near, yet the Body within is a sensible Impediment to the Extention of its Action without. This brings to my mind the unsuccessfulness of the Attempt I made to attract Bodies with a Tube exhausted of its Air ; which seems to conclude, there being no Air within, to bear the *Effluvia* from its Body, a *continuum* of their Parts must consequently be prevented,

Now how far these Experiments and Observations serve to Account for the premention'd *Phænomenon*, in Relation to the Motion given Bodies within the Glass by the approach of a Body towards its outside, I leave wholly to this *Honourable Society* to determine.